Društvo za geotehniku u Bosni i Hercegovini
Друштво за геотехнику у Босни и Херцеговини
Geotechnical Society of Bosnia and Herzegovina
GEO-EXPO 2019
Sarajevo, 23 - 25 October 2019

doi.org/ 10.35123/GEO-EXPO_2019_8

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DESIGN AND REAL SCALE VERIFICATION OF A GEOGRID REINFORCED CELLULAR MATTRESS

Summary:

To satisfy client's safety, budget and time requirements the contractor has decided to utilize a geogrid reinforced cellular mattress and the design approach as described in the Dutch STOWA guideline 2019-02a to design 50 required crane platforms for the erection of 120-meter-high wind turbines. Summarized insights suggest utilizing mechanically stabilized layers which consists of two components: geosynthetics and recycled rubble. This combination compared to traditional unstabilised construction increases the bearing capacity of the crane hardstand by interlocking the granular fill. As a result, more than 50% of material savings were achieved in addition with reduced construction time while still complying with safety standards. To assess the validity of the design approach and design assumptions, a third party – hired by the client – executed monitoring activities in some of the constructed crane hard stands. The validation was performed by simulating a real-life crane loading situation on the mechanically stabilized matrass and measuring settlement over the loaded period. The crane hardstand performed well within expectations. From the gathered data, it can be observed that the crane hardstand complies with mandatory safety specifications. It can be concluded that both the geogrids reinforced cellular matrass and STOWA design approach can be used as a safe and economical basis for realization of current and future wind-farms projects planned in areas with weak soil conditions, without the need for piles or gravel columns.

Key words:

Geogrid – MSL – cellular mattress – crane hardstand – STOWA – verification – real scale – Netherlands – wind farm – Eurocode

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